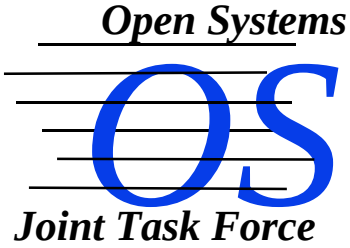


Electronic Power Specification Standardization (EPSS) NAECON'98

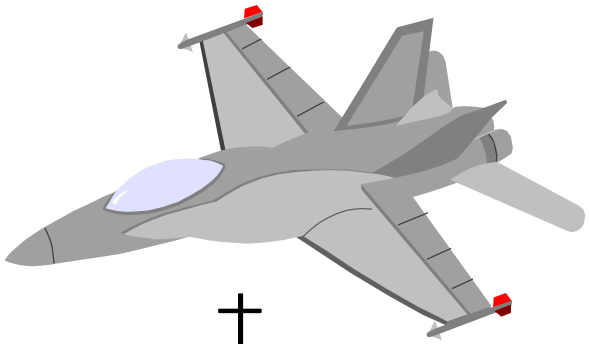
15, 16 July 1998

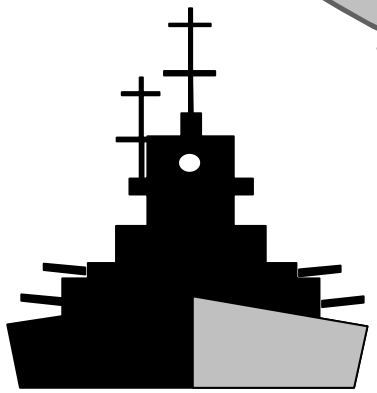
Dayton Convention Center, Rm 203

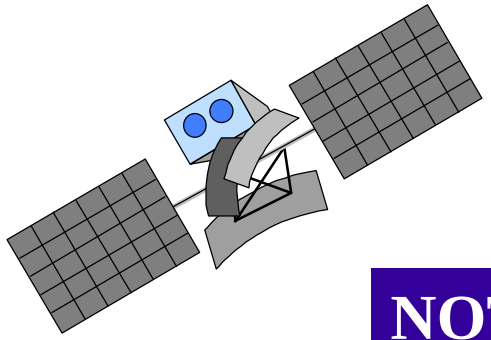
Meeting Logistics

- Meeting for both days in this room - 8:30am to 5pm
- Amenities
- Message Phone Number:
- Fax Number:

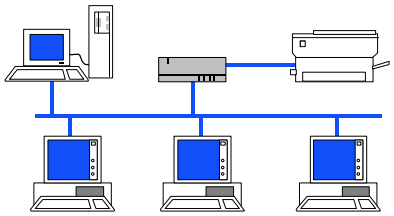
EPSS Paradigm Facilitates the Approach



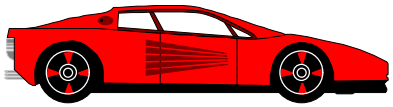




Electronic Power Distribution Systems are found in virtually all electronic hardware



Purpose in all applications is to provide regulated service voltages that are required by the functional electronic systems



NOT PRODUCT DISCRIMINATORS

EPSS Description

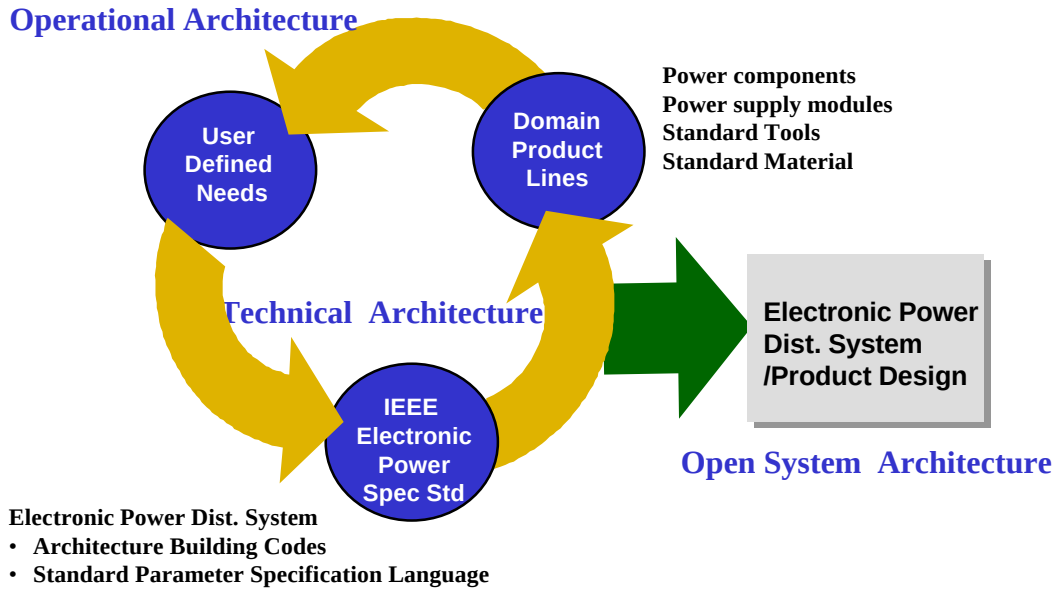
Open Systems OS Joint Task Force

Intra-operability Concept

Industry Driven Technical Architecture

Maximize Use of Commercial Resources Across Multiple Systems

Electronic Power Dist. System Development Process



Thrust:

Develop a series of commercial based broadly used standards which define:

- ***Specification Language:*** *test parameters, conditions, and methods to impart integrity in product development, characterization, and advocacy*
- ***Building Codes:*** *purposeful common sense rules to govern interfaces for Power Supply Systems (PSS)*

Agenda: Day 2

16 July 1998 - **EPSS Consortium Meeting**

- Introductions 8:30am
- Review and Discussion of Consortium Workshop Minutes
- Key Events Since the Workshop
- Summary and Discussion of COTS Conference 1998
- Brainstorm: Potential PSS Development Building Codes
- Review of IEEE P1515 Recommended Practice Draft #1
- Review Action Items
- Recap & Wrap Up 5pm

Next Meeting Announcement

Other Related Standardization Activities

IEEE 1156.2 **This is a standard for environmental specifications for computer systems.** It contains minimum environmental withstanding conditions applicable to computer systems and their associated components. It defines such parameters as: atmospheric stress, corrosion, drop heights, electrical stress, EMI, ESD, fire resistance, flammability, humidity, level of qualification, mechanical stress, shock, sinusoidal vibration, thermal shock, thermal testing, vibration, etc. This standard has been approved for publication.

IEEE P1156.3 **This will be a standard for Power Supply Specifications for Computer Systems.** This standard is to create a generic power supply specification to support IEEE bus standards. This standardization activity is being performed because existing computer bus standards only provide a brief, incomplete set of specifications for a power supply and often none at all. This is an ongoing activity.

SAE AE-7 **This is a standardization activity which is dealing with primary power distribution standards.** The ultimate standard will define primary power distribution voltage, power quality, etc. This is an ongoing activity.

IEEE P1515 **This is a standardization activity for electronic power distribution system specification language standardization.** The purpose of this standard will NOT be to create a generic specification, but rather to create a standard "specification language" which both customers and product developers use to unambiguously communicate specifications. Consequently, this standard will define a set of parameters that can unambiguously characterize the elements of power distribution systems; this will include description of system parameters and their applied test conditions, and test methods. This is an ongoing activity.

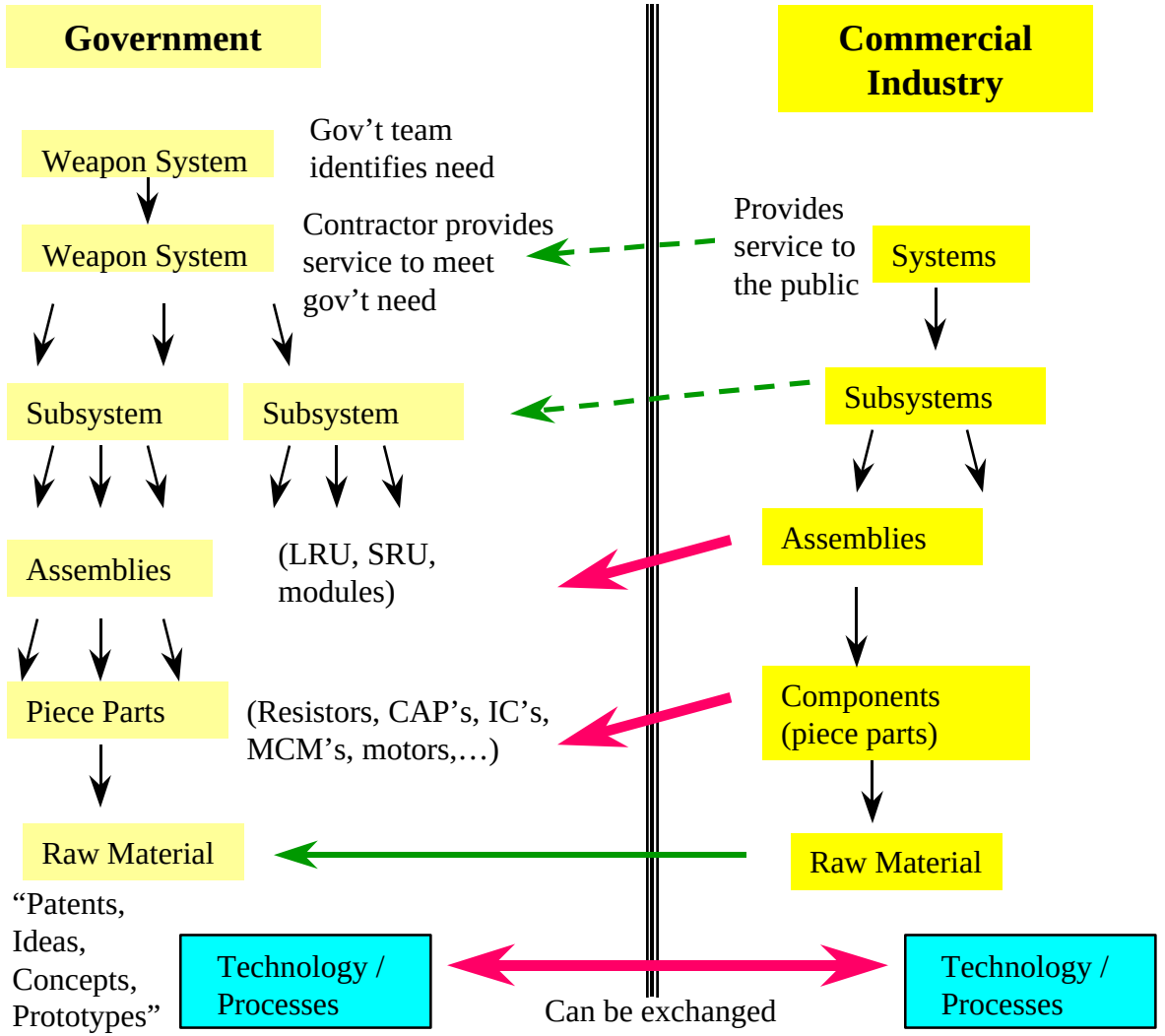
Power Supply System Consortium **The deliverable is a "building codes" standard for power supply system development**; it will enable government and military contractors to reference and sensibly apply commercial resources. These "building codes" are essentially rules which guide the government and the military contractor in the development of power supply system products, processes, and practices to enable intelligent use of commercial resources. The purpose of these rules is to help the government to better utilize what commercial industry has to offer. This is an ongoing activity.

Consortium Approach

Open Systems OS Joint Task Force

Focus on Harmonizing Interfaces & Broad Usage

Top Down Advocacy



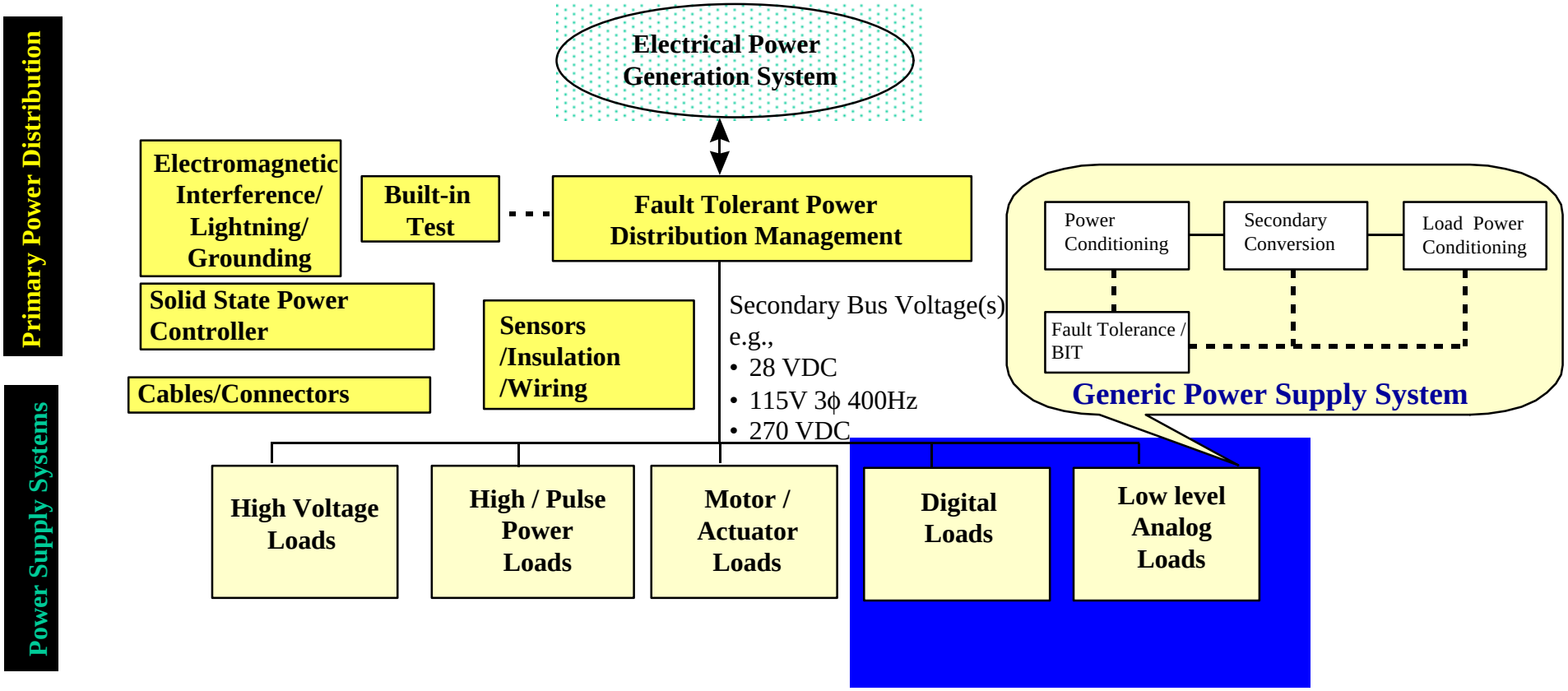
Bottom Up Standardization

SRU= Shop Replaceable Unit
LRU= Line Replaceable Unit

P1515 and Consortium Application Domain

Open Systems OS Joint Task Force

P1515 Specification Language has broad applicability



EPSS Consortium Building Codes must be focused

DC/DC Power Supply Market Share: *Military 9%*
Industrial & Telecommunication 53%

EPSS Consortium Concept

- **Composition:** Electronic System Developers and Integrators with Support from Power Supply Developers
- **Purpose:** Recommend to DoD and Weapon System Contractors how consortium members will utilize commercial resources/CRs (practices, processes, products, services, and components) in their development of Power Supply Systems (PSS).
- **Strategy for implementation of CRs**: Use the Technical Architecture Concept - develop Building Codes

Consortium Workshop Minutes Discussion

Kickoff Meeting
Minutes

Double Click on the ICON and the Office'95 Consortium Kickoff Meeting Minutes document will open

Key Events Since Last Meeting

- PSMA Participation
  - Desire to be involved
  - Members apprehensive about committing their resources …. Yet want a standard that will be useful
  - Executive Board has taken the action to define their initial commitment of resources
  - URL: http://www.psma.com/HTML/twelc.html
- COTS Conference
  - Issues discussed and documented in the Consortium Kickoff meeting are consistent with the issues facing industry as a whole
  - No silver bullet presently exists

PSMA Background

- The PSMA Mission is:

  To integrate the resources of the power sources industry to more effectively and profitably serve the needs of the power sources users, providers and PSMA members.

- PSMA provides industry leadership!

  The PSMA encourages technological and marketing developments in power products and educates the industry, academia and government agencies on the value and use of all types of power sources.

- PSMA Committee's - Work Vehicles
  - Agency Liaison
  - Battery
  - Capacitors
  - Connectors
  - Magnetics
  - Manufacturing
  - Marketing
  - Power Electronics Packaging
  - Power Semi-Conductors
  - Quality
  - Technology Roadmap

COTS Conference Summary

- COTS must be used; trick is figuring out the best way
- COTS issues are system engineering issues, and must be solved within the system engineering process
- A standard is determined by wide spread market acceptance; not a standards body
- Single Board Computer (SBC) vendors are deeply involved in how to perform COTS insertion
- Not all applications are suitable for COTS insertion, but a large majority are

COTS Conf Summary

This is a OFFICE 97 Document, Double click to Open it

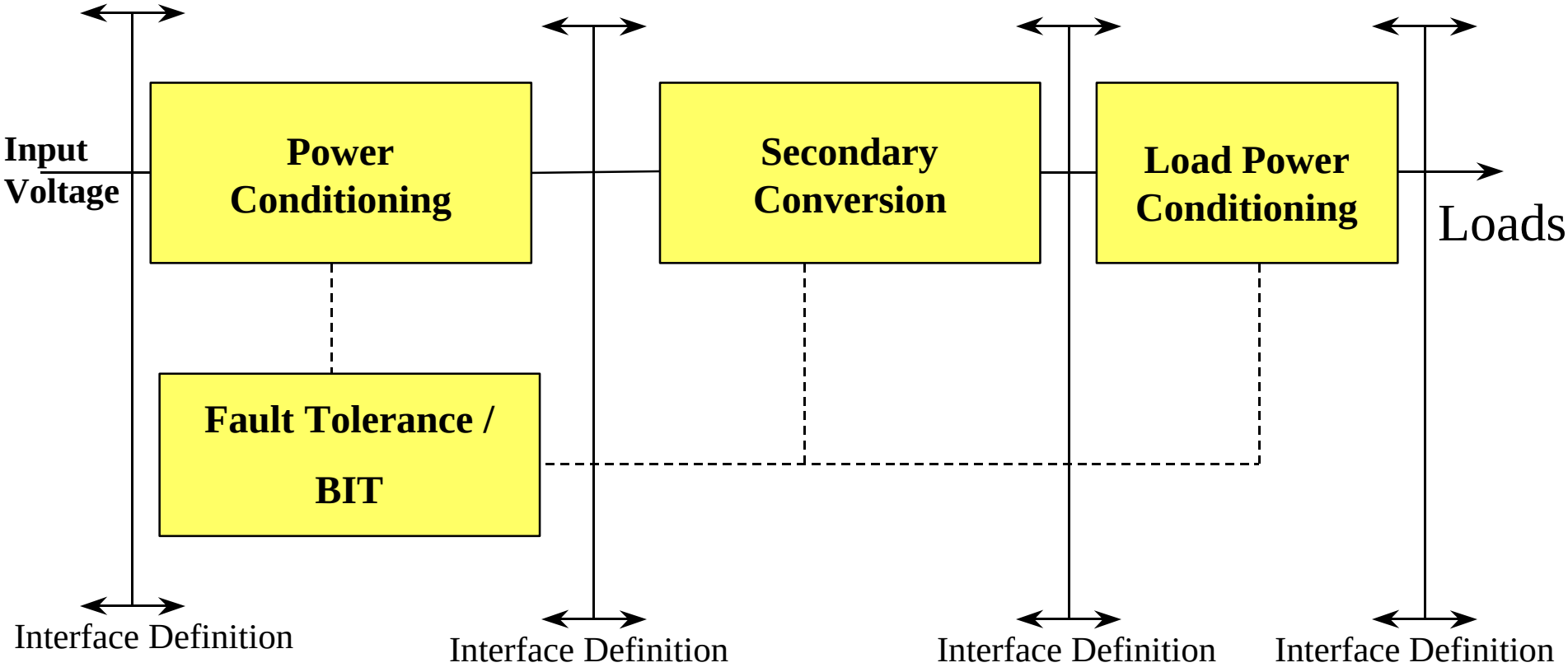
PSS Development Rules / Building Codes

Open Systems Joint Task Force

BRAINSTORMING SESSION

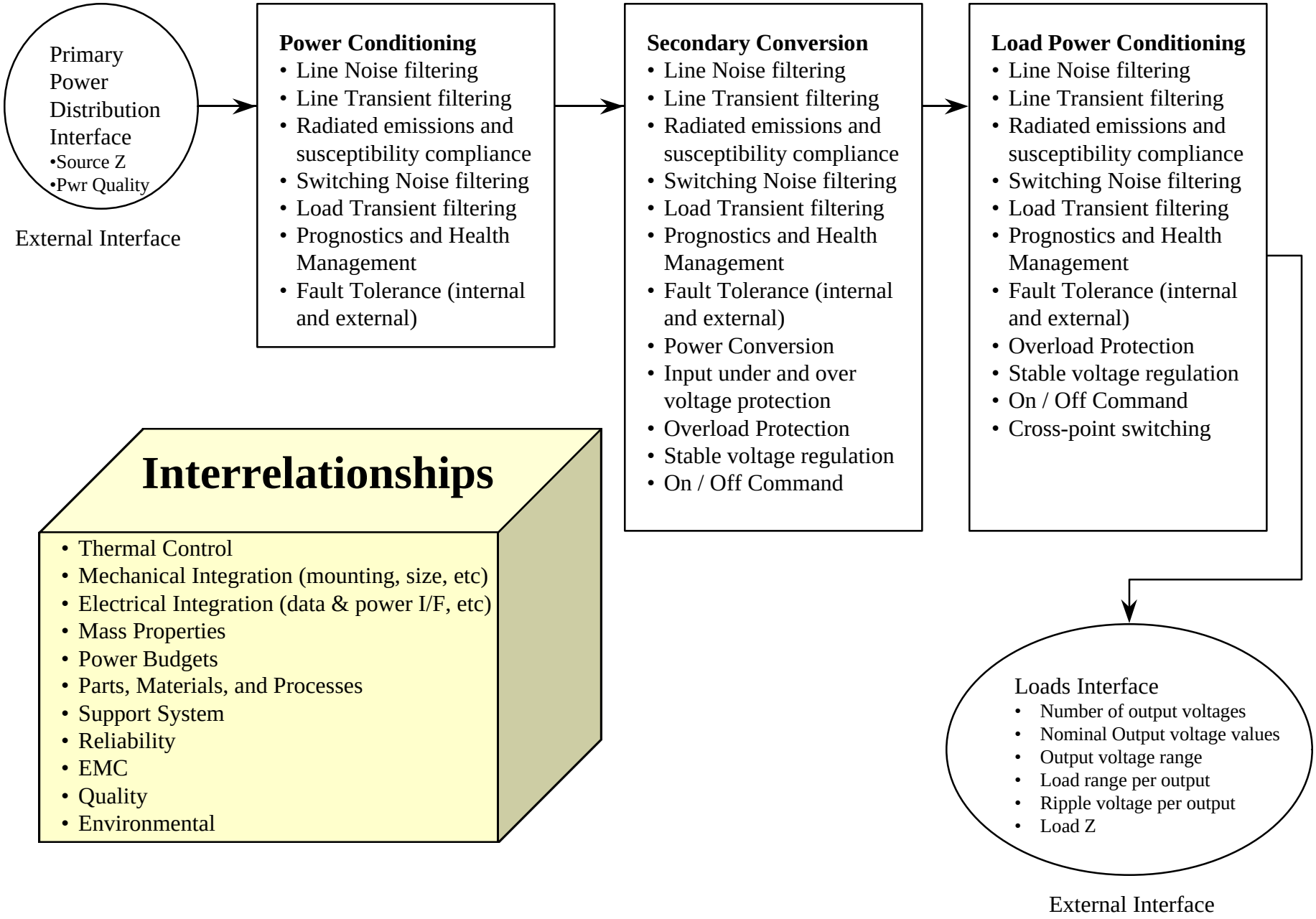
- **A Rule is defined as a "regulating principle or fundamental assumption"**
- **Focusing on building codes / rules to govern interfaces**

Power Supply System Electrical Interfaces



Still need to consider mechanical, environmental, and system effectiveness Interfaces

GENERIC OPERATIONAL ARCHITECTURE



Notional PSS Development Rules

- Electrical
  - » Maximum Source impedance
  - » Load impedance Characterization method and value
  - » Electronic Parameter definitions, test conditions, test methods
  - » etc.
- Mechanical
  - » standard Lengths, widths, and heights
  - » Minimum thermal conductivity - assembly level
  - » etc
- Environmental
  - » Operating temperature range
  - » Random vibration levels
  - » etc
- System Effectiveness
  - » Piece Part Screening Minimum Requirements
  - » Qualification and Re-qualification of Assemblies minimum requirements
  - » BIT / Fault Tolerance Minimum Requirements
  - » etc

Structured Approach

Technical Architecture Rules Identification

- Structured brainstorming to identify all potential rule categories
  - »Electrical, mechanical, environmental, system effectiveness
  - »By the “7 Problems”
- Clarify rule categories, summarize, and achieve consensus
- Structured brainstorming to identify rules under each category
- Clarify rules for each category
- Summarize rules for each category

Agenda: Day 2

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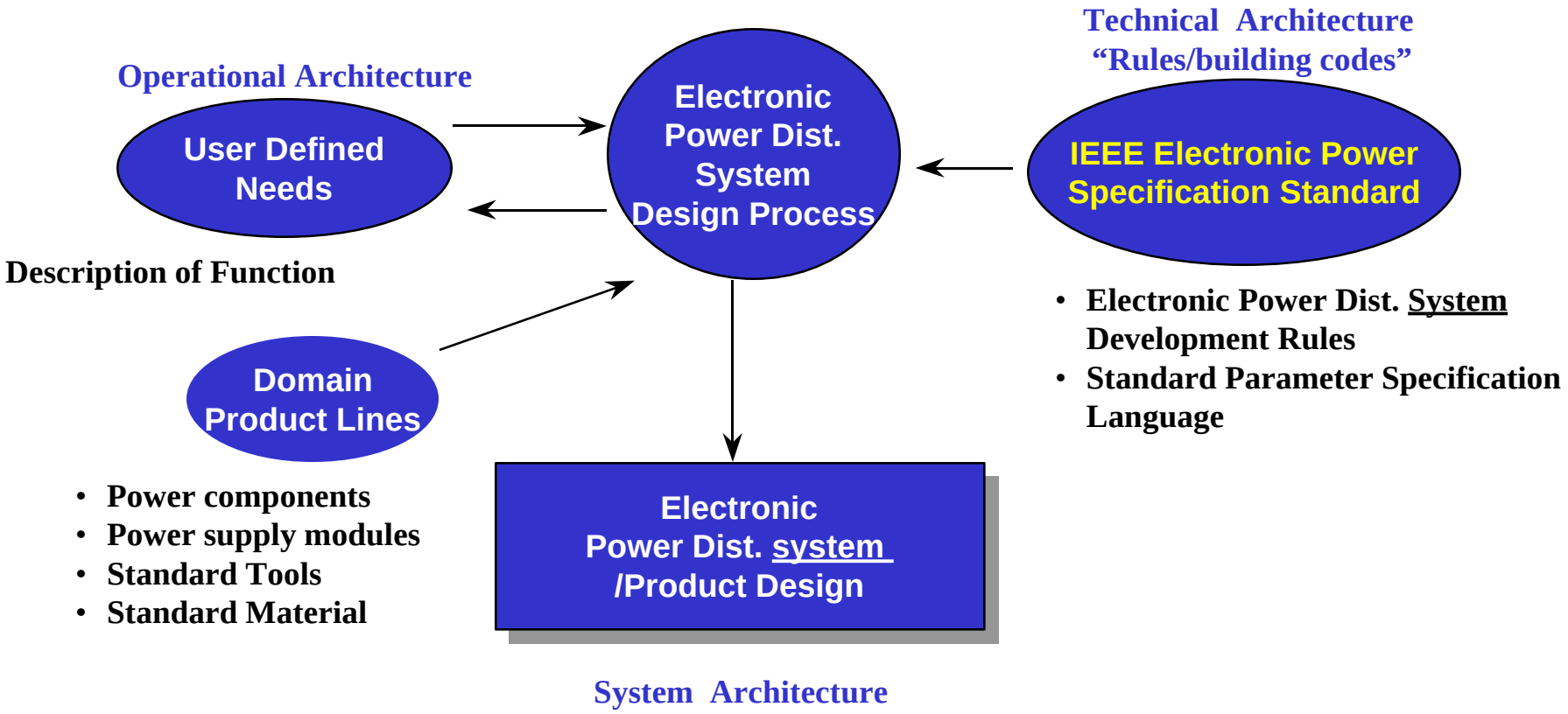
Back ups

New Paradigm for the Power Dist. System Development Process



- **EPSS is focused on developing Technical Architectures**
- **Usage of Technical Architectures facilitates the use of CRs**
  - **Military 9% of power supply market**
  - **Industrial and Telecommunications 53% of power supply market**

PSS Technical Architecture / Building Code Development Approach

Questions that need to be answered to determine PSS Technical Architecture contents:

1) **What information do designers (PSS designers, power supply designers, filter designers, cross switch designers, etc.) need to design power supply systems?**

2) **What PSS interfaces (electrical, reliability, supportability, material, process, environmental, mechanical, piece parts, etc.) need to be defined to maximize intra-operability?**

3) **How should the PSS interfaces be defined to maximize the use of commercial resources (practices, processes, products, services, and components)?**

EPDS = Electronic Power Distribution System

Technical Architecture Rules Development Approach

Questions that need to be answered to determine PSS Technical Architecture contents:

1) **What information do designers (PSS designers, power supply designers, filter designers, cross switch designers, etc.) need to specify power supply systems?**

This question is being partially addressed by the IEEE P1515 Working Group

Consortium needs to address HOW to use the parameter definitions, test conditions, test methods defined by P1515 to specify PSS elements

EPDS = Electronic Power Distribution System

Technical Architecture Rules Development Approach

Questions that need to be answered to determine EPSS Technical Architecture contents:

2) **What PSS interfaces (electrical, reliability, supportability, material, process, environmental, mechanical, piece parts) need to be defined to maximize multi-system usage, and enable affordable incremental upgrades?**

3) **How should the PSS interfaces be defined (rigorously) to maximize the use of commercial resources (practices, processes, products, services, and components)**

Consortium needs to address these two questions

EPDS = Electronic Power Distribution System

EPSS Problem & Mission Statements

EPSS Problem

The inability to effectively use commercial based resources (products, processes, services, components, etc.) across multiple systems, and to affordably support incremental upgrades

EPSS Mission

- **Goal: Establish open standards for broad use by electronic power distribution subsystem users and developers**
- **Objective: Standards define:**
  - **<u>Specification language</u> to impart integrity in product development, characterization, and advocacy**
  - **<u>Practices/Rules</u> for effective commercial based EPDS development**
- **Intent: enable acquisition of cost and time effective EPDSs by enhancing product characterization, advocacy, quality, testability, and intra-operability.**
- **Success: Defacto and Standards broad usage**

Strategy is to help military industry determine how to make better use of what commercial industry has to offer

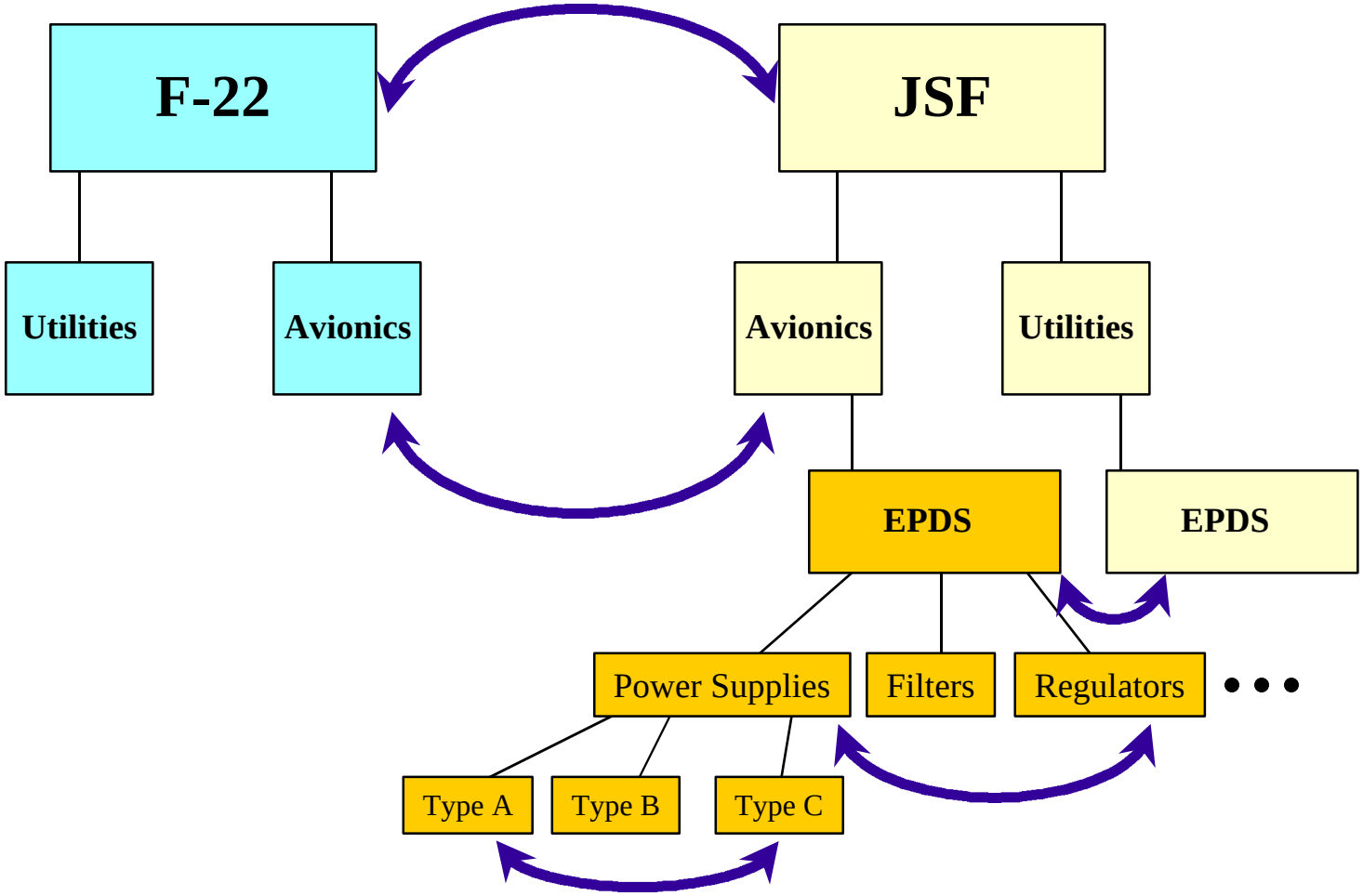
Intra-operability

- Definition: *the extent to which methods of development are used throughout a system to enable economy or efficiency*
- To Obtain Intra-operability
  - Focus on an area of interest…….EPDS
  - Establish a technical architecture (building codes) within this area of interest……EPDS

Intra-operability Example

Open Systems
OS
Joint Task Force

Intra-operability can exist at all system levels



Technical Architectures Already Exist

- **Each development organization essentially follows its own basic building codes ("technical architecture"), or development rules**
- **Knowledge base can be enhanced and used across the industry if PSS organizations would pool their resources to develop a common base for development of power supply systems.**
  - Knowledge base could span: Parameter Definitions, test conditions, test methods, piece parts, power quality capabilities, connectors, footprints, allowable dissipation, deratings, architecture elements, etc.

Therefore, the question is <u>not</u> whether an PSS technical architecture(s) needs to be developed but rather how much of your respective "technical architectures" will electronic system developers want to share

Why the Consortium should be successful

Secondary electronic power distribution subsystems and products are:

- *a significant portion of electronic system cost*
- *prevalent in electronic systems*
- *not considered product discriminators*

Organizations should be willing to pool resources to achieve a large payback in the form of an industry solution.

1998 Calendar of Events

Title	Purpose	Date	Location
IEEE P1515 and 1998 EPSS Working Group Kickoff	Held in conjunction with the Advanced Power Electronics Conference (APEC). Status and direction briefing will be provided. Group rules will be established and assignments and due dates agreed to.	15 and 16 February 1998	Anaheim, CA
EPSS Consortium Kickoff Meeting	Status and direction briefing will be provided. Group rules will be established and assignments and due dates agreed to.	15, 16 April 1998	Dayton, OH
Open Systems Conference	Present status to the Office of the Secretary of Defense (OSD) on the EPSS activity	29, 30 April and 1 May 1998	Alexandria, VA
EPSS Consortium and P1515 Working Group Meeting	Held in conjunction with the National Aerospace and Electronics Conference (NAECON). The purpose will be a Technical Interchange meeting regarding the P1515 recommended practice, and a status and discussion session concerning the EPSS consortium.	13-14 July 1998	Dayton, OH
P1515 Working Group Meeting	Held in conjunction with the International Telecommunications and Energy Conference (INTELEC). The purpose will be a Technical Interchange meeting regarding the P1515 recommended practice	4-8 Oct 1998	San Francisco, CA
Year End Review	Held in conjunction with the Digital Avionics System Conference (DASC). The purpose of this meeting will be to summarize EPSS progress and accomplishments, and to recommend future activities.	31 Oct to 6 Nov 1998	Seattle, WA